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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/900,110	07/06/2001	John Fan	P119US1	5745
7590	12/01/2004		EXAMINER KIM, KEVIN	
Patent Department Iospan Wireless P.O. Box 641867 San Jose, CA 95164-1867			ART UNIT 2634	PAPER NUMBER

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/900,110

Applicant(s)

FAN, JOHN

*AK*

Examiner

Kevin Y Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26-29 is/are allowed.
- 6) ☒ Claim(s) 1-8 and 14-20 is/are rejected.
- 7) ☒ Claim(s) 9-13 and 21-25 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07/06/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/6/01</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 25 is objected to because of the following informalities: it appears that “of” in the phrase “decoding of second common bit groupings” on line 7 should be deleted for the sake of consistency with respect to language used to define “subtracting” and “combining.” Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-8 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cansever et al. (US 6,807,648) in view of Wallace et al (US 6,473,467).

Consider claim 1. Referring to Fig.3, Cansever et al discloses a forward error correction method in a wireless communication system, comprising;

“receiving a plurality of data streams” (100), see col.6, lines 14-15,

“selecting at least one bit from each of the plurality of the data streams forming a first bit grouping” in that the data separator (142) selects header bits from each packet to form a header portion, see col.6 lines 15-16,

“selecting at least one bit from each of the plurality of the data streams forming a second bit grouping” in that the payload bits from each packet are selected to form “a second bit

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grouping,” in that the data separator (142) selects payload bits from each packet to form a payload portion, see col.6 lines 15-16,  
“coding the first bit grouping,” (150), see col.6, lines 19-23,  
“coding the second bit grouping,” (156), see col.6, lines 26-31, and  
“transmitting the coded first bit grouping and the coded second bit grouping.” See Transmitter (20) in Fig.1. Cansever et al fails to teach “transmission through spatially separate antennae” recited in claim 1 and “each data stream is transmitted from a corresponding spatially separate antenna.”

Wallace teaches a diversity transmitter using a plurality of antennas, see Fig.1A and col.4, lines 48-49, at least for the purpose of improving performance, i.e., lowering bit error rate. See col.3, lines 36-47, col.6, lines 39-46 and col.11, line 58 – col.12, line 4, in particular, describing transmission of data through a corresponding one of a plurality of antennas. Thus, it would have been obvious to one skilled in the art at the time the invention was made to transmit the encoded data packets of Cansever et al through a plurality of antennas for the purpose of lowering error rate as taught by Wallace et al.

Regarding claim 2 calling for “selecting a plurality of bits from each data stream” for “forming a first bit grouping,” since the header consists of a plurality of bits, see Fig.2, Cansever et al discloses selecting a plurality of bits from each data packet to form a first bit grouping, which is a header portion.

Regarding claim 3 calling for “selecting a plurality of other bits from each data stream” for “forming a second bit grouping,” since the payload consists of a plurality of bits, see Fig.2,

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Cansever et al discloses selecting a plurality of other bits from each data packet to form a second bit grouping, which is a payload portion.

Regarding claim 4 transmitting each data stream “from a corresponding spatially separate antenna,” Wallace describes an embodiment of diversity where data streams is demultiplexed into four data sub-streams, one data sub-stream for each transmit antenna. See col.9, lines 31-32.

Clam 5 requires that “the plurality of data streams are generated from a single primary data stream. Cansever is silent whether the data packets (100) are generated from a singly primary data stream. Wallace et al further teaches a combination of antenna, frequency and/or time diversity as a way of improving performance. See col.3, lines 34-39. it is quite established that the time diversity means repeated transmission of a same data in temporal succession. In other words, a plurality of data streams are generated from a single primary data streams and transmitted sequentially. Thus, it would have been obvious to one skilled in the art at the invention was made to generate repeat a packet for a number of times to generate a plurality of data packets in Canserver et al’s transmitter as suggested by Wallace for the purpose of further improving performance.

Regarding claims 6 and 7 calling for “Reed Solomon coding” as a coding scheme, see Cansever et al, col. 4, lines 61-64 describing any known coding may be adapted to the Cansever’s device including Reed Solomon coding.

Regarding claim 8 calling for a limitation that “the data streams comprise N-QAM symbols,” Cansever et al teaches any type of quadrature amplitude modulation (QAM) for the packets. See col. 4, lines 10-18. In other words, bits in the packets are mapped to one of symbols of QAM, reading on the limitation.

Consider claim 30. Referring to Fig.3, Cansever et al discloses a forward error correction system in a wireless communication system, comprising;

“means for receiving a plurality of data streams” (140), see col.6, lines 14-15,

“means for selecting at least one bit from each of the plurality of the data streams forming a first bit grouping” in that the data separator (142) selects header bits from each packet to form a header portion, see col.6 lines 15-16,

“means for selecting at least one bit from each of the plurality of the data streams forming a second bit grouping” in that the payload bits from each packet are selected to form “a second bit grouping,” in that the data separator (142) selects payload bits from each packet to form a payload portion, see col.6 lines 15-16,

“means for coding the first bit grouping,” (150), see col.6, lines 19-23,

“means for coding the second bit grouping,” (156), see col.6, lines 26-31, and

“means for transmitting the coded first bit grouping and the coded second bit grouping.”

See Transmitter (20) in Fig.1. Cansever et al fails to teach “transmission through spatially separate antennae.”

Wallace teaches a diversity transmitter using a plurality of antennas, see Fig.1A and col.4, lines 48-49, at least for the purpose of improving performance, i.e., lowering bit error rate. See col.3, lines 36-47, col.6, lines 39-46 and col.11, line 58 – col.12, line 4, in particular, describing transmission of data through a corresponding one of a plurality of antennas. Thus, it would have been obvious to one skilled in the art at the time the invention was made to transmit the encoded data packets of Cansever et al through a plurality of antennas for the purpose of lowering error rate as taught by Wallace et al.

4. Claims 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cansever et al. (US 6,807,648) in view of Wallace et al (US 6,473,467) and Hinedi et al (US 6,263,466).

Claim 14 defines a method of error correction decoding comprising;

“receiving a plurality of data streams received through spatially separate antennae,”

“selecting at least one bit from each of the plurality of the data streams forming a first bit grouping,”

“selecting at least one other bit from each of the plurality of the data streams forming a second bit grouping,”

“decoding the first bit grouping,”

“decoding the second bit grouping,” and

“constructing decoded bit streams based upon the decoded first bit grouping and

the decoded second bit grouping.” The claimed invention in claim 14 is essentially

a reverse process of the invention defined in claim 1 at a receiver side. Although Cansever et al

in combination with Wallace teach the invention of claim 1 drawn to an encoding system, the

combination fail to disclose an error correction decoding at a receiving side that would

correspond to the error correction encoding method. However, Hinedi et al teaches a decoding

method that reverses an encoding method in a wireless communication system. Specifically, Fig.

10 of Hinedi et al shows that each of received data streams is separated into a first grouping, i.e.,

header, and a s second grouping, i.e., payload, by a demixer (124) and each group is separately

decoded (126,133). Thus, it would have been obvious to one skilled in the art at the time the

invention was to reverse the encoding sequence of Cansever et al at a receiver by receiving data

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packets, selecting encoded header bits from each packet to form “a first grouping” and encoded payload bits to form “a second grouping,” decoding each group in accordance with their respective error encoding method, and constructing the whole packet from the decoded header and payload bits, as taught by Hinedi et al.

Furthermore, Wallace et al teaches a diversity receiver using a plurality of antennas to improve reliability of the communication link. See col.5, lines 62-67. Thus, it would have been obvious to at the time the invention was made to design the decoding method, as explained above, to receive data stream through spatially separate antennae for the purpose of improving reliability of the communication link, as taught by Wallace et al.

Regarding claim 15, calling for “selecting a plurality of bits from each data stream” for “forming a first bit grouping,” since the header consists of a plurality of bits, see Fig.2, Cansever et al discloses selecting a plurality of bits from each data packet to form a first bit grouping, which is a header portion.

Regarding claim 16 calling for “selecting a plurality of other bits from each data stream” for “forming a second bit grouping,” since the payload consists of a plurality of bits, see Fig.2, Cansever et al discloses selecting a plurality of other bits from each data packet to form a second bit grouping, which is a payload portion.

Regarding claim 17 calling for “a corresponding spatially separate antenna,” see Fig.1 of Wallace and col. 6, lines 48-51.

Regarding claims 18 and 19 calling for “Reed Solomon coding” as a coding scheme, see Cansever et al, col. 4, lines 61-64 describing any known coding may be adapted to the Cansever’s device including Reed Solomon coding.

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Regarding claim 20 calling for a limitation that “the data streams comprise N-QAM symbols,” Cansever et al teaches any type of quadrature amplitude modulation (QAM) for the packets. See col. 4, lines 10-18. In other words, bits in the packets are mapped to one of symbols of QAM, reading on the limitation.

***Allowable Subject Matter***

5. Claims 9-13,21-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
6. Claims 25-29 are allowed, subject the objection of claim 25 is resolved.
7. The following is a statement of reasons for the indication of allowable subject matter: no prior art has been found to teach or suggest forming a first bit grouping and a second bit grouping by selecting respective one or more of bits from a data stream for separate encoding wherein selecting the first bit grouping and a second bit grouping is based on the significance of the bits within N-QAM symbols.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

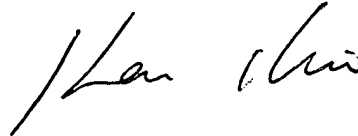
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

kvk

KEVIN KIM  
PATENT EXAMINER

A handwritten signature in black ink, appearing to read 'Kevin Kim', is written over the printed name and title.